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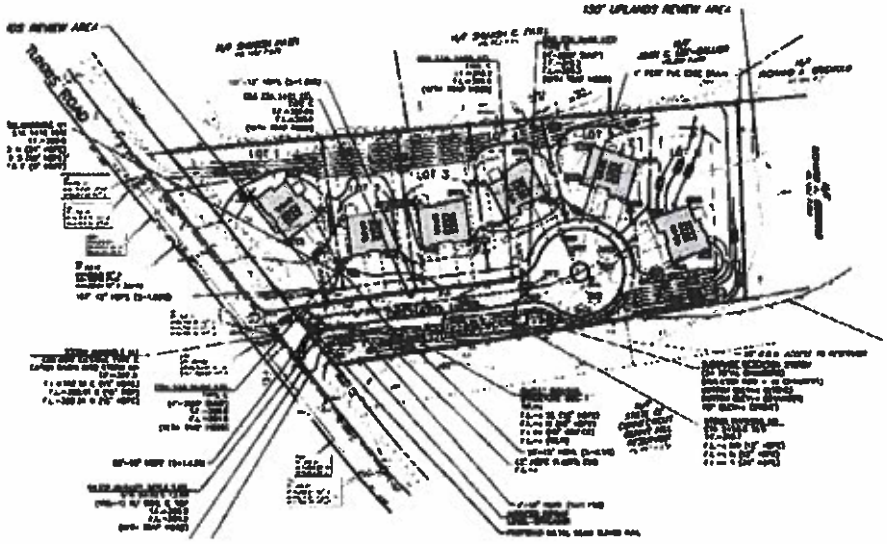
REPORT

July 1, 2019

Stormwater Management Report

Prepared for:
The Bongiovanni Group

Site Location:
380 Tunxis Road
West Hartford, Connecticut



1.0 INTRODUCTION

Weston & Sampson is pleased to submit this Stormwater Management Report on behalf of the applicant. A six (6) lot residential subdivision is proposed at 380 Tunxis Road in West Hartford, CT. The 2.6 Acre property is located on the north side of Tunxis Road and is bordered by the Farmington Town line/residential properties to the west, a residential property to the north, and a State-owned property associated with the Burnt Hill Reservoir to the east. Refer to the Location Plan in Appendix A.

A 400 linear foot public road and cul-de-sac is proposed to provide direct access from Tunxis Road to the residential properties. The site development will also include curbing, bituminous concrete driveways, landscaping, utilities, retaining walls, and a stormwater management system.

2.0 DESIGN METHODOLOGIES

All storm drainage has been designed in accordance with the State of Connecticut, Department of Transportation, Drainage Manual. The Rational Method was used for the development of peak flows for the storm sewer design while SCS Runoff (TR-55) was used for the detention design. Minimum times of concentration were 5 minutes for paved areas and 10 minutes for grassed areas. All other times of concentration were calculated using the TR-55 method. Precipitation records for each design storm are taken from NOAA Atlas 14, Volume 10, Version 2, Precipitation Frequency Data Server for West Hartford, CT. Refer to Appendix F for this information. Runoff coefficients of 0.3 (Lawns), and 0.9 (Pavement and Roofs) were used for the storm drainage design

The Hydraflow Storm Sewers program was used for the analysis of storm sewer pipe flow, gutter-flow, and hydraulic grade line. The roadway storm sewer system has been designed with the capacity necessary to convey the 10-year frequency design storm. The storm sewer system design can be found in Appendix C.

The Hydraflow Hydrographs program was used for pre-development and post-development analysis of the various drainage areas including the routing of hydrographs through the proposed subgrade detention system. This system has been designed with the capacity necessary to convey and control the 100-year frequency design storm. The Pre and Post-Development Hydrograph Analysis as well as the design of the proposed subgrade detention system pond can be found in Appendix B.

3.0 PRE-DEVELOPMENT SITE CONDITIONS

The existing property is mostly lawn with some wooded areas to the north and has an existing home with paved driveway.

The existing site is divided into three (3) pre-development drainage areas as follows (See Figures 1 and 2 in Appendix A):

Pre-Development A:	Runoff from the southern portion of site generally flows in a southeasterly direction to a Discharge Point located at an existing catch basin located on Tunxis Road.
Pre-Development B:	Runoff from the majority of the project site generally flows in an easterly direction to a Discharge Point located along the eastern property boundary. It is important to note that offsite runoff enters the 380 Tunxis Road property from the west and contributes to pre-development area "B".
Pre-Development C:	Runoff from the northern portion of the property generally flows in a northeasterly direction to a Discharge Point located along the northern property boundary. It is important to note that offsite runoff enters the 380 Tunxis Road property from the west and contributes to pre-development area "C".

A summary of the pre-development peak runoff rates can be seen in Table 1.

4.0 POST-DEVELOPMENT SITE CONDITIONS

The post-development watersheds have been divided into three (3) drainage areas for the purposed of comparing peak rates of runoff with that of pre-development, and can be seen in Figure 3 in Appendix A.

Roadway and front-yard site runoff will be controlled by a roadway storm drainage system consisting of Town Standard (Type C Top) catch basins and shall discharge to a plunge-pool level spreader prior to leaving the site. A second storm drainage system will capture the majority of remaining on-site and offsite runoff and shall discharge to a subgrade detention system. Prior to leaving the site, this runoff will discharge to a plunge-pool level spreader located at the northeast corner of the site. The majority of roof runoff will be captured by the proposed storm drainage systems while the remaining will be allowed to sheet flow overland. All proposed piping within the development (except for PVC roof leaders) is high density polyethylene (HDPE) and has been sized to control the 10-year design storm. The layout of the system along with pipe sizes and lengths, inverts, top of frames, etc. can be seen on the "Drainage Schematic" or Figure 5 in Appendix A. The storm sewer calculations, which includes pipe hydraulics, gutter-flow analysis, and hydraulic grade line analysis can be seen in the Hydraflow results presented in Appendix C.

The roadway drainage system shall have coarse sediment removal through the use of 2' and 4'-deep sumps catch basins. The primary means for stormwater treatment will be provided by water quality structure (WQS-1). This structure is designed to treat the majority of site runoff and is specified to be a hydrodynamic separator from the CTDOT list of approved products. The structure is capable of removing 80% of total suspended solids (TSS) as well as preventing migration of oils and other floatables. Refer to Appendix D for water quality flow (WQF) and bypass sizing calculations for the proposed water quality structure. A modified riprap splashpad will provide outlet protection while a turf reinforced level-spreader will further reduce discharge velocities and convert concentrated runoff to sheet-flow prior to discharging runoff to the adjacent wetlands to the east. These measures are

consistent with procedures indicated in the Connecticut Stormwater Quality Manual. It is anticipated that the combination of these structural BMP's will be most effective in controlling and eliminating sediment, oil and grease, leaves and grass clippings, and seasonally elevated runoff temperatures.

The second site drainage system will utilize a treatment train approach. Prior to entering the subgrade detention system, pre-treatment shall occur from the combined use of 2' and 4'-deep sumps catch basins. The first-flush (WQV) of site runoff shall also be directed through the detention system "isolator row". Refer to Appendix D for the associated Water Quality Volume (WQV) calculation. The isolator chamber row is wrapped in a non-woven geotextile, which is designed to capture any additional sediment that has not been captured in the upstream measures. The subgrade detention system is a chamber-type system surrounded by crushed stone and wrapped in filter fabric (See Figure 6 in Appendix A). The system has not been designed for infiltration and as an added factor of safety, will have a thermoplastic PVC liner on the bottom and sides to prevent lateral exfiltration. A proposed outlet control structure will release the detention system discharge at a reduce peak rate of runoff (See Figure 7 in Appendix A). Should the proposed orifices within the outlet control structure OCS-1 become clogged, the weir wall and 12" HDPE outlet pipe will pass the 100-year storm. This additional analysis has been provided in Appendix B. A modified riprap splashpad will provide outlet protection while a turf reinforced level-spreader will further reduce discharge velocities and convert concentrated runoff to sheet-flow prior to discharging runoff to the adjacent wetlands to the east. These measures are consistent with procedures indicated in the Connecticut Stormwater Quality Manual.

5.0 EROSION & SEDIMENTATION CONTROL MEASURES

In order to protect the adjacent properties and resource areas from construction related activities, a Soil Erosion and Sediment Control Plan has been developed in accordance with the latest Connecticut Guidelines for Soil Erosion and Sediment Control. This plan will be implemented prior to the start of any site disturbance and will involve the combined use of perimeter silt fencing, hay bale barriers, an anti-tracking pad, and vegetative stabilization. Refer to design plans for soil erosion and sediment control notes, construction sequence, and details.

Once a contractor has been selected and a construction schedule has been established a person shall be named and will be responsible for implementation of sediment and erosion control measures. This responsibility includes the acquisition of materials, installation, and maintenance of erosion and sediment structures, the communication and detailed explanation to all people involved in the site work of the requirements and objective of the erosion and sediment control measures.

Weston and Sampson (860) 616-6623 located at 273 Dividend Road, Rocky Hill, Connecticut, 06067 shall be notified of any proposed alteration to the erosion and sediment control plan, prior to altering, in order to ensure the feasibility of the addition, subtraction, or change in the plan.

An Operation and Maintenance Plan has been prepared for the proposed erosion and sediment control measures during the construction of the stormwater system. This plan shall be implemented at the onset and throughout construction activities until the project is complete. This plan provides guidelines for when the stormwater system should be cleaned, and associated record keeping and can be found in Appendix E.

6.0 SUMMARY

A Pre & Post Development analysis (Appendix B) has been performed to show that the total peak flow rate for the 2 thru 100-year design storms has not increased over that of pre-development. A summary of the pre and post-development peak flow rates for each Subarea is shown below in Table 1:

Table 1
Pre and Post-Development Peak Flows

	2-year, 24-hour storm		10-year, 24-hour storm		25-year, 24-hour storm		50-year, 24-hour storm		100-year, 24-hour storm	
Drainage Subareas	**Peak Flow (cfs) (Pre)**	**Peak Flow (cfs) (Post)**	**Peak Flow (cfs) (Pre)**	**Peak Flow (cfs) (Post)**	**Peak Flow (cfs) (Pre)**	**Peak Flow (cfs) (Post)**	**Peak Flow (cfs) (Pre)**	**Peak Flow (cfs) (Post)**	**Peak Flow (cfs) (Pre)**	**Peak Flow (cfs) (Post)**
A	0.70	0.55	1.72	1.32	2.42	1.81	2.97	2.20	3.54	2.60
B	2.14	2.27*	5.12	4.97*	7.13	6.90*	8.70	8.33*	10.31	10.86*
C	0.82	0.54	1.90	1.25	2.63	1.73	3.19	2.10	3.77	2.48
Total (Site)	**3.66**	**3.24**	**8.74**	**7.16**	**12.18**	**10.01**	**14.87**	**12.20**	**17.61**	**14.39**

* Peak flow represents that which is reduced/mitigated as a result of subgrade detention (Post-Development Subarea B3)

It can be seen from the results in Table 1, that the proposed Stormwater Management System will effectively serve to mitigate the effects of the proposed site improvements. The total post-development peak flow for the various design storms is below that of pre-development.